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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/055,580

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Jin-Yuan Lee

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07/25/2006

NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION
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EXAMINER

MITCHELL, JAMES M

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/055,580	Applicant(s) LEE ET AL.	
	Examiner James M. Mitchell	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 92-162 is/are pending in the application.
- 4a) Of the above claim(s) 94,95,98,124,130 and 155 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 92,93,96,97,99-123,125-129,151-154 and 156-162 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to applicant's election filed March 12, 2006.

Election

Claims 94, 95, 98, 124, 130-150 and 155 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on March 12, 2006.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 92, 93, 96, 97, 99-123, 125-129, 151-154 and 156-162 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The disclosure of only one species, a **flip chip connected to a substrate**, is not sufficient to constitute the genus of the newly claimed "first electric component"¹ "...bonded to...second electric component,"

¹ This encompasses any component in the generation, transmission, distribution or consumption of electric power, including for example relays, capacitors, resistors and portions of IC.

"A patentee will not be deemed to have invented species sufficient to constitute the genus by virtue of having disclosed a single species when ... the evidence indicates ordinary artisans could not predict the operability in the invention of any species other than the one disclosed." In re Curtis, 354 F.3d 1347, 1358, 69 USPQ2d 1274, 1282 (Fed. Cir. 2004) (Claims directed to PTFE dental floss with a friction-enhancing coating were not supported by a disclosure of a microcrystalline wax coating where there was no evidence in the disclosure or anywhere else in the record showing applicant conveyed that any other coating was suitable for a PTFE dental floss.) See M.P.E.P §§2163.04, 2163.05.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 92, 93, 96, 97, 99-123, 125-129, 151-154 and 156-162 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura (U.S. 6,706,554) in combination with Burnette et al. (U.S. 6,552,436).

Ogura² (Fig 1H, 1J, 2A, 23D) discloses:

(cl. 92) a bonding structure (26) suited for bonding a first electric (understood to be limited to a chip) component and a second electric component (understood to be a

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substrate) comprising: a pillar (22) over said first electric component (10); and a cap (26) over said pillar, wherein said cap has a greatest transverse dimension less than a transverse dimension of said pillar, said cap suited for being bonded to a pad (36) of said second electric component (32), and cap is formed over said pillar before said first electric component is bonded to said second electric component (Fig. 1J);

(cl. 101, 105, 122, 153, 159) further comprising a conductive layer (26; Fig. 23D) between pillar and cap with the pillar having height greater than the metal, conductive layer;

(cl. 103, 161) with the traverse of the layer being greater than the traverse of the cap (Fig. 23D);

(cl. 117, 118, 121, 152) where the component is a portion of wafer forming chip.

Ogura does not appear to show that the substrate has a patterned solder mask/insulation layer with at least one opening that exposes the pad, or wherein the solder cap has a largest transverse dimension smaller than a transverse dimension of the opening in the patterned solder mask.

Burnette (Fig. 2) teaches use of a patterned solder mask with openings exposing a pad, such that the opening is larger than the pad.

It would have been obvious to one of ordinary skill in the art to incorporate a patterned solder mask with openings exposing the pad of Ogura, such that its transverse of the solder cap is smaller than the traverse of its opening in the mask, in

² Alternatively any of the cited art showing a cap with smaller transverse than a pillar such as Greer (U.S. 6,346,469) could have been used to in lieu of Ogura.

order to prevent solder over areas not wanted as taught by Burnette (Col. 1, Lines 46-49).

With respect to the process limitation that the cap is formed over said pillar before said first electric component is bonded to said second electric component, the prior art forms the same structure as claimed and also the process. However, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

With respect to claim 93, 97-100, 104, 106-117, 119, 123-126, 129, 151, 154-158 and 162 applicant’s claimed materials for example copper, silver alloy for either the pillar or cap, applicant has not disclosed that his choice of material produce unexpected results or otherwise critical³. As such, the selection of claimed material would have been obvious to one of ordinary skill in the art⁴, since it has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) (Claims to a printing ink comprising a solvent having the

³ Lack of criticality is further evidence by applicant's own dependent claims that shows that changing material does not affect device. Also equivalency was establishes in the previous office action filed March 23, 2005.

⁴ In addition Ogura encompasses use of all material since its disclosure only requires that its pillar has a “material having conductivity,” the disclosure then merely provides “examples”. See Col. 4, Lines 58-63.

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vapor pressure characteristics of butyl carbitol so that the ink would not dry at room temperature but would dry quickly upon heating were held invalid over a reference teaching a printing ink made with a different solvent that was nonvolatile at room temperature but highly volatile when heated in view of an article which taught the desired boiling point and vapor pressure characteristics of a solvent for printing inks and a catalog teaching the boiling point and vapor pressure characteristics of butyl carbitol. "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle." 325 U.S. at 335, 65 USPQ at 301.); See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious); *Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 8 USPQ2d 1323 (Fed. Cir. 1988) (Claimed agricultural bagging machine, which differed from a prior art machine only in that the brake means were hydraulically operated rather than mechanically operated, was held to be obvious over the prior art machine in view of references which disclosed hydraulic brakes for performing the same function, albeit in a different environment.).

With respect to size indicated for example in claim 102 and 127 and 160 that the conductive transverse being smaller than transverse of pillar, applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical⁵. As such, the size would have been obvious, since it has been held that mere dimensional limitations are *prima facie*

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obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. In an effort to expedite prosecution of this application, examiner has addressed some arguments that may still be relevant.

Applicant contends that because Ogura failed to show attaching its component to a pad exposed by an opening in an insulation layer, and that Burnnette did not show use of pillars that the their combination would be improper since they were structurally different. Examiner disagrees. Both references deal with flip chips interconnected to a substrate. Therefore, one of ordinary skill in the art would be motivated to look at art in an effort to insure protection of its substrate's underlayer. The fact that the interconnect is a different shape does not eliminate the motive a person of ordinary skill in the art looking at references that deal with problems of interconnection would have in an effort to establish the most reliable connections. For the reasons stated, applicant's arguments are deemed unpersuasive.

⁵ Lack of criticality further evidence by applicant's claim indicating that traverse is smaller in one instance

Conclusion

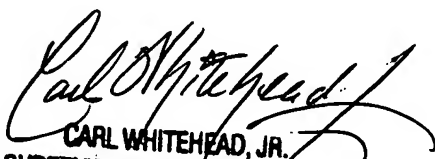
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jmm, J.D.
July, 22, 2006

and greater in another.


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
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